Organization of Environmental Concerns Information

Background: The MIRA approach is designed to utilize decision-maker defined criteria in an organized framework that consistently and transparently provides information to decision makers. Starting with the articulation of the decision question, the MIRA approach guides decision makers through detailed discussions of which criteria and data are helpful to answering that decision question. For the screening analysis of 85 mining permits, the decision question is: "Which mining permits warrant further evaluation based on Clean Water Act environmental concerns?"

Using the decision criteria in an analytical hierarchy defined and designed by the decision makers, the MIRA approach allows decision makers to use expert judgment and a variety of perspectives to screen the mining permits. Each perspective is represented by a MIRA preference set. However, since MIRA is an iterative, learning-based approach, there is no single MIRA preference set that is "correct" and the purpose of using MIRA is to examine a large number of possible perspectives and applying the use of the criteria consistently to all permits using these perspectives.

Summary: EPA Regions III, IV and V decision makers gathered in several meetings to discuss the decision hierarchy, relevant criteria, available data and possible perspectives. The result of these meetings is the use of 58 criteria, considering both the underlying environmental condition of the watershed of the proposed mine as well as the proposed mine's impacts on water quality and its proposed mitigation.

Development of the MIRA Preference Sets: Construction of the MIRA preference sets was based on extensive discussions among the EPA regions regarding the decision question, the construction of the hierarchy, the decision criteria/indicators and the data used to populate those indicators. Particular attention was paid to the Clean Water Act Section 404(b)(1) guidelines and water quality parameters such as conductivity, index of biological integrity (IBI), and the types and lengths of streams affected. There was also extensive consideration of cumulative effects and how existing watershed condition and additional proposed impacts in the watershed are considered under the CWA 404(b)(1) guidelines. In general, mines with larger surface area disturbance, more streams affected, more valley fills, and greater impact on expected conductivity readings triggered more concern than those with fewer of those characteristics.

MIRA Preference Sets:

Region 3: The specific initial preferences identified by Region 3 staff and management using the full hierarchy and data set.

Region 4: The specific initial preferences identified by Region 4 staff and management using the full hierarchy and data set.

Region 5: The specific initial preferences identified by Region 5 staff and management using the full hierarchy and data set.

All Mine Impact: Only looking at the data relating to the proposed mine impacts.

All Environmental Condition: Only looking at the data relating to the existing environmental condition of the watershed(s) of the proposed mine.

Mine Impact / Mine Footprint: Full data included with emphasis on the proposed mine impacts to aquatic resources and the proposed mine's overall surface area of disturbance.

SAD / Stream Length / Conductivity: Full data included with emphasis on the proposed mine's surface area of disturbance, linear feet of stream impacts, and potential to degrade water quality by changing conductivity.

SAD / Conductivity: Full data included with emphasis on the proposed mine's surface area of disturbance and potential to degrade water quality by changing conductivity.

Mine Impact with an Emphasis on Stream Length: Full data included with additional emphasis on the proposed mine's impacts, specifically on the linear feet of stream impacts.

Environmental Condition: Full data included with additional emphasis on the existing condition in the watershed(s) of the proposed mine.

Mine Impact with an Emphasis on Avoiding Impacts in Least Disturbed Areas: Full data included with additional emphasis on the proposed mine's impacts, specifically on avoiding least disturbed watersheds.

Mine Impact with an Emphasis on Avoiding Impacts in Most Disturbed Areas: Full data included with additional emphasis on the proposed mine's impacts, specifically on avoiding the most disturbed watersheds.

Mine Impact with an Emphasis on Conductivity: Full data included with additional emphasis on the proposed mine's impacts, specifically the potential to degrade water quality by changing conductivity.